

to provide in-stream benefits when it is routed through the system)? A few answers have come to light as these types of transfers become more common. However, standardizing these answers or developing other practical answers is warranted.

Potential Solution Options

The following options could provide rules and guidelines for environmental water transfers:

- Rules to ensure that environmental transfers satisfy the same legal requirements as consumptive use transfers under state and federal law.
- Outreach and education to transfer proponents of the multiple benefits that can be achieved by specific transfer proposals. Can an environmental entity provide incentives for water transfer during particular time periods? Is water transferred via Section 1707 available for rediversion at a point downstream from its intended use?
- Adoption of the Ecosystem Roundtable's water transfer principles that state, among other things, that all instream transfers will be subject to the same criteria as other water transfers.

3.4 TECHNICAL, OPERATIONAL, AND ADMINISTRATIVE RULES

3.4.1 TRANSFERRABLE WATER AND THE "NO INJURY" RULE

Generally, transfers of water must cause no injury to other legal users of water, regardless of other's seniority. Transfers that would injure another legal user of water or the environment may be prohibited or conditioned, as a result of Board findings or legal action. Some stakeholders are concerned that these rules are not always interpreted and applied uniformly by agencies with jurisdiction over transfers.

The amount of water that can be transferred based on fallowing or crop shifting is determined by the reduction in consumptive use and irrecoverable losses. However, there is not always agreement on what is meant by, or how to quantify, "consumptive use." In addition, even when the amount of water produced by a reduction in "consumptive use" can be agreed on, the extent to which downstream users may be affected or injured by a transfer of this water may be disputed.

Various Water Code sections define "consumptive use" as water "which has been consumed by use through evapotranspiration (ET), has percolated underground, or has been otherwise removed from use in the downstream water supply as a result of direct diversion." Some stakeholders (potential buyers or sellers of transferred water) are concerned that the interpretation of this definition, which limits fallowing or crop-shift transfers only to the reduction in ET and irrecoverable losses, is overly restrictive. Others believe that the determination of consumptive use values and the application of the "no injury" rule is not

sufficiently rigorous and results in permitted transfers that injure other downstream legal water users, particularly in terms of flow timing and water quality.

There is no disagreement that water consumed by the crop (ET of applied water) is part of the consumptive use measure and, if foregone, is transferrable. There is, however, some dispute about the transfer of surface water runoff (tailwater) that is not recaptured and reused, and that would otherwise be available to a downstream user. In other words, if it is permissible for the water user to recapture tailwater for his own use, thereby depriving the downstream user of its benefit, can the user reduce tailwater production by irrigation system improvements and transfer the saved water? Under most interpretations of current law, the “no injury” rule does not apply in the first case, but it does apply to water transfers when a water right change in place or purpose of use is required.

There is no dispute that water that otherwise would have percolated to unusable groundwater is transferrable. However, some disagree regarding the circumstances under which water that would otherwise percolate to **usable** groundwater may be transferrable. One view argues that all such water remains available to the system and is not “real” water and, therefore, not transferrable. The other view argues that this water could be transferred on a short-term basis, when no short-term impact on the groundwater basin results.

Water percolating below the crop root zone as a result of over application of irrigation water (which is necessary to some extent for leaching of salts) enters the “vadose zone.” This is the portion of the soil column below the root zone but above the aquifer. Water movement through this zone is known as vadose zone transport. Transport is affected by several variables but most significantly by gravity and soil type (permeability).

The rate at which water moves through the vadose zone affects the rate of recharge to the aquifer. The recharge rate is not always known; therefore, the consequence of changing the rate of transport through the vadose zone cannot always be determined. The extent to which other legal users of water may be affected by changing this transport rate (as a result of a groundwater substitution transfer or irrigation efficiency improvements, for example) also depends on other variables that result in a recharge or drawdown of the aquifer, including subsurface lateral flow, precipitation, streamflow accretions and depletions, and rates of withdrawal by other overlying users. Therefore, it is not clear whether reducing percolation below the root zone (by an irrigation improvement or water conservation measure), that would otherwise eventually move through the vadose zone to a usable aquifer (or affect the rate of recharge to the aquifer), will necessarily injure another legal user of water.

Potential Solution Options

The following is a potential solution option for issues concerning transferrable water and the “no injury” rule:

- A standardized set of policies, guidelines, or formal rules on transferrable water, agreed to by the U.S. Bureau of Reclamation (USBR), California Department of Water Resources (DWR), SWRCB, and other interested parties, which would clarify the agencies' interpretations of the requirements for quantification of transferred water.

3.4.2 SAVED OR CONSERVED WATER

Section 1011 of the Water Code protects saved or conserved water from loss due to forfeiture or abandonment and also authorizes the transfer of saved or conserved water pursuant to any applicable provisions of law relating to the transfer of water or water rights. Agencies and stakeholders disagree about the application of this provision, in particular whether saved or conserved water can be transferred under Water Code section 1725 only to the extent of the transferor's reduction in consumptive use. If the saved or conserved water is water which would in the absence of the conservation measure return to the system as tail water, return flow or (in some cases) deep percolation, the agencies generally take the position that such water is not transferable under section 1725, because it is not produced by a reduction in consumptive use. The State Board must also be satisfied that the transfer of such water would not injure any other legal user of water. (Transfer of saved or conserved water under another water code provision may not be subject to the same consumptive use test, but it would be subject to the "no injury" rule.)

DWR's 1993 publication "Water Transfers in California, Translating Concept into Reality," discusses conserved water transfers in the Sacramento Valley. The publication states that:

... New water can be created only by reducing losses to unusable water bodies (rare in the Sacramento Valley), reducing surface outflow during periods of excess Delta outflow, reducing consumptive use of crops, or environmentally acceptable reductions in consumptive use of non-agricultural vegetation. Reducing percolation to groundwater depletes another part of the system and can penalize other users by direct reduction of groundwater supplies, decreasing groundwater discharge to surface streams or increasing percolation from surface supplies to groundwater. Reducing drainage outflow during the irrigation season merely reduces the supply available downstream.

Over the past several years, water suppliers generally have been encouraged by state law to adopt and implement water conservation plans (i.e., AB 3616). CVP contractors are required by federal law to adopt and implement such plans. The public policy intent behind these laws is to encourage the highest level of reasonable and beneficial use of water. An illustration of the benefit of conservation is that if the same crop production can be achieved with 20% less water than was historically required, in dry years (when 20% less water is available), the same production value can be realized. Conservation measures can also result in other benefits, such as operational savings, endangered species protection or enhancements and improved water quality.

Some water rights holders believe that reductions in applied water and improvements in application efficiency can or should result in saved or conserved water being available for transfer to other beneficial uses, without limitation by a reduction in consumptive use or with a more flexible consumptive use analysis. These interests argue that if saved or conserved water is not more freely transferrable, there is little financial incentive to adopt and implement conservation practices encouraged by the public policy.

In addition, in spite of law to the contrary, there is a concern that conservation measures actually may create a risk to water rights or contract rights to water, if the saved or conserved water is not continually and regularly put to beneficial use

Potential Solution Options

The following is a potential solution option for concerns about saved or conserved water:

- A standardized set of policies, guidelines, or formal rules on transferability of saved or conserved water, agreed to by Reclamation, DWR, the SWRCB, and other interested parties, which would clarify the agencies' interpretations of the requirements for quantification of saved or conserved water.

3.4.3 OPERATIONS CRITERIA AND CARRIAGE WATER REQUIREMENTS

Carriage water is defined as the additional water that may be necessary to accompany a cross-Delta water transfer to maintain water quality or other standards imposed on Delta water export operations.

Historically, water transferred across the Delta has been subject to a carriage water requirement imposed by the state and federal water projects (SWP and CVP) as a condition of exporting water in their Delta export facilities. In some cases, this has amounted to as much as 20-30% of the quantity being transferred. More recently, the Bay-Delta Water Quality Control Plan (WQCP) limits project exports to 35% or 65% of Delta inflow (depending on the time of year). It is generally agreed that transfers should be subject to this requirement, referred to as the export/inflow (E/I) ratio, if the ratio is controlling in the Delta. In other circumstances, some disagree on how carriage water requirements should be calculated and applied. When the E/I ratio is not controlling, the carriage water ratios have historically been much less than the 35% or 65%.

Carriage water requirements add significant cost to a transfer and sometimes make a transfer economically infeasible. On the other hand, low or no carriage water requirements may require the CVP and SWP to in effect "subsidize" a transfer, if outflow requirements other than the E/I ratio are controlling. This "subsidy" would occur if the CVP or SWP needed to release additional water to meet operating criteria (i.e., outflow or X2) as a result of the conveyance of a transfer.

All interests seem to agree that under the current WQCP, carriage water requirements should not apply so long as the water quality standards and outflow objectives are being met without reservoir releases from the CVP and the SWP, the E/I ratio is not controlling, and the Delta is not in "balanced" conditions (i.e., when the Delta is in excess conditions).

In other words, so long as the outflow and water quality standards are being met and the transfer does not increase the burden of these obligations on the projects, the transfer water should "ride on top" of project water as it comes across the Delta. (As a practical matter, however, under these conditions pumping capacity may not be available for transfers, since the projects probably would be pumping at maximum capacity to move project water.)

Project operators take the position that transfers should be subject to carriage water requirements but the requirements may vary, depending on outflow conditions, pumping

levels, and residual effects in the Delta. If the Delta is in balanced conditions and the projects are making storage releases to meet outflow or water quality requirements, the project operators will want to assess carriage water requirements. If the E/I ratio is controlling, the project operators will want the transfer to be subject to the same export limitation.

The foregoing discussion applies to transfers from the Sacramento River to the export service area. For transfers on the San Joaquin River system, Reclamation and DWR have assessed a 5-10% conveyance surcharge on transfers to account for losses, including illegal diversions, from the point of release to Vernalis. Some stakeholders believe that this requirement should be based on actual losses, if the losses can be measured. Project operators agree with this view and point out that the actual losses may in fact be much higher than 10%, but measurement of such losses is difficult.

Potential Solution Options

The following are potential solution options for disagreements about operations criteria and carriage water requirements:

- Agency/stakeholder process to develop carriage water criteria, including use of a technical team to review current science and make improvements in the understanding of carriage water requirements.
- Formulation of the through-Delta alternative to reduce or eliminate the need for carriage water.

3.4.4 DWR/USBR RESERVOIR REFILL REQUIREMENTS

[This is a subset of the application of the “no-injury” rule (see Section 3.4.1) and is included here solely as it relates to DWR and USBR water rights¹.]

The transfer of water that has been stored or would have been stored absent the transfer is a very common method of transferring water. These transfers typically have limited direct effects on water users because the water either has been or would have been removed from the system in the absence of the water transfer. However, the indirect effects of these types of transfers sometimes are a point of controversy, between the selling party and potentially impacted legal users of water, regarding application of the “no injury rule.”

A transfer of stored water creates vacated storage behind the transferor's reservoir that would not have been present absent the water transfer. This vacated storage will be refilled sometime during the wet period of the year. Typically, this refill is considered to occur late in the refill/storage season after the vacated storage from normal operations has already been refilled. When this additional refill occurs (as a result of an emptier reservoir from the previous season's transfer), it can have impacts on legal users of water who have in the past

¹There are other users of water that can be affected by stored water transfers besides the SWP and CVP, though this discussion is limited to impacts solely to their water rights. In some cases downstream appropriators might be injured by a transfer of this kind. If they are affected, these affects should be mitigated to non-injury or the transfer would not be approved, as required under various sections of the California Water Code.

relied on this water to meet their own demands. The no injury rule requires an evaluation to determine if the refill of vacated storage caused by a stored water transfer has effects on legal users of water.

In the Bay/Delta watershed, both the Central Valley Project (CVP) operated by the USBR and the State Water Project (SWP) operated by the DWR have in the past claimed injury due to stored water transfers. DWR and USBR argue that in the absence of the transfer, more water would be in the system in the subsequent year or years to meet project obligations (contract deliveries, Delta outflow, or water quality requirements). The transfer also might cause the reservoir refill to be delayed, with a possible impact on conditions in the Delta—causing the CVP/SWP operators to release additional flows to maintain Delta standards. They have requested that the State Water Resources Control Board apply specific refill criteria to such a transfer to ensure that they are not deprived of water that they would normally have been able to appropriate. Transferors of stored water contend that their actions do not cause harm to other legal users of water, especially to the CVP and SWP.

Potential Solution Options

The following are potential solution options for issues concerning reservoir release transfers:

- Negotiated agreement on refill percentage and assumption of risk/liability; incorporation of percentage or risk into sales price of water.
- Policy to require reservoir refill impact analysis and identify appropriate mitigation measures.
- Agreement on applicability of refill criteria and method to determine amount of refill or monitor actual refill impacts.

3.4.5 STREAMLINING THE TRANSFER APPROVAL PROCESS

Because of conveyance and pumping capacity limitations, parties to a water transfer often have a narrow window of time in which a transfer can be physically accomplished. Some consider that the permitting and regulatory process requirements restrict and impair the ability to accomplish transfers in a timely manner to meet these narrow windows. Agencies tasked with reviewing and approving a proposed water transfer, however, contend that the proponents often provide inadequate data to make necessary findings required by state or federal law. Consequently, the state and federal agencies are required to perform their own analysis or collect additional data and information, adversely affecting the time schedule. A primary purpose of the state and federal transfer provisions is to protect other legal users of water from being adversely affected by a water transfer. Efforts to further streamline the approval process must not undermine this objective.

Potential Solution Options

The following are potential solution options for issues related to the transfer approval process:

- Development of a standardized checklist for the transfer approval process.
- Encouragement of potential “buyers” and “sellers” to improve water supply planning during non-emergency conditions so that proposed transfers can be approved prior to a water supply emergency.
- Development of an expedited approval process for certain types of transfers that have not caused appreciable concerns for legally protected interests so that some categories of transfers can be “pre-approved” (i.e., certain intra-basin transfers).

3.5 WHEELING AND ACCESS TO FEDERAL AND STATE CONVEYANCE FACILITIES

3.5.1 PREDICTABILITY OF ACCESS FOR TRANSFERRED WATER IN EXISTING STATE AND FEDERAL FACILITIES

Water transferred across the Delta must be pumped and conveyed by CVP or SWP facilities. Given the complexity of Delta operations and the level of demand for water from the state and federal projects, it is difficult to reliably provide access to project facilities for conveyance of cross-Delta water transfers. Generally, the capacity for cross-Delta transfers in CVP and SWP export pumping facilities is not predictable. In dry years, because of reductions in project water deliveries, the likelihood for excess capacity does increase, making available capacity slightly more predictable.

As a practical matter, the availability of project pumping capacity for project water and transfers alike has been reduced in recent years by required pumping reductions in February through June and additional “make-up” pumping, which must then occur in fall. Other fishery protection and water quality requirements that may occur throughout the year also reduce the available capacity. The effect of these actions is to further narrow the window for pumping and conveyance of cross-Delta water transfers.

Under current policy, pumping and conveyance of project water has priority over non-project transfers. This, coupled with operational restrictions based on unpredictable conditions such as water quality levels and environmental constraints that vary continually, makes it difficult for project operators to make firm commitments regarding the conveyance of non-project water. The pumping of project water is subject to these same unpredictable variables.

This lack of predictability in the timing or availability of project facilities for pumping, conveyance, and storage of transferred water discourages cross-Delta transfers. Buyers are reluctant to purchase water, for short- or long-term transfers, not knowing whether it will be delivered when needed. However, given the current limitations in the Delta and the legal and contractual obligations of the projects to move project water before moving transferred water, it is nearly impossible for project operators to provide the same degree of reliability for transferred water, even in the short term, as they provide for project water deliveries.

A related concern that limits state and federal project operators from agreeing to move non-project water is the potential for the additional water being pumped to result in a “take” of a fish listed under the ESA that may not have otherwise occurred. This limit could adversely affect regular project pumping. DWR and USBR are concerned that a transferor would not have additional water to mitigate for such impacts; thus, the projects would be “subsidizing” the transfer.

Potential Solution Options

The following are potential solution options for the lack of predictable access for transferred water in existing facilities:

- More flexible operating criteria would provide for optimized pumping of project water at certain times of the year, thereby creating a larger transfer window at other times of the year.
- Implementation of mechanisms to reduce diversion impacts on fish would decrease the probability of export limitations resulting from such fishery impacts (i.e., new fish screens, modified intake facilities).
- Additional capacity for storage and delivery of project water would create an additional benefit of more and larger transfer windows, even with the current priority requirements.
- Increased Delta export pumping capacity would generate more windows of opportunity for conveyance of non-project transfers.
- Wider distribution of information on access to facilities, including how requests are processed and how unused capacity is determined.
- Modify policies and procedures governing access to facilities, including how to determine priorities, how to process requests, and how to determine unused capacity.
- Assemble and distribute information regarding transfer windows and risk factors.

3.5.2 PRIORITY OF TRANSFERRED WATER IN NEW FACILITIES

A new conveyance facility would not necessarily be subject to the same access priority rules as existing facilities. This raises the question of how new conveyance capacity should be

allocated between project water and transferred water. Some capacity in a new cross-Delta conveyance facility, or increased through-Delta conveyance capacity, could be dedicated to water transfers. The issue is how much capacity would be reserved for transfers and on what basis would it be made available among transfer proposals?

Potential Solution Options

The following is one potential solution option to issues concerning the priority of transferred water in new facilities:

- Dedicated priority for a portion of the capacity in new facilities.

3.5.3 WHEELING COSTS

State and federal law require CVP and SWP operators to charge for the use of project facilities to convey transferred water. Some stakeholders contend that the interpretation of these laws by the CVP and SWP result in higher wheeling costs than should be charged. Determining consistent and agreeable methods and justification for costs associated with wheeling transfers through state and federal conveyance facilities is necessary for transfer proponents to factor these costs into their planning.

Potential Solution Options

The following are potential solution options for the issue of wheeling costs:

- CALFED agencies work with stakeholders and the Legislature to formulate agreement on recovery of capital and operations and maintenance costs of facilities, pursuant to existing law.
- New legislation on wheeling costs (See “Legislative Activities” sidebar, p. 2-5).